

Project: NESHAP 2009 ANNUAL REPORT		Analysis / Calculation No.: NESH-101
Subject: TRITIUM EMISSIONS FROM BLDG A-1 SOURCE WELL WATER CY 2009		Revision No.: 0
Prepared: (Sign / Date) Robert F. (Frank) Grossman	Checked: (Sign / Date) Ronald W. Warren	
Manager: (Sign / Date) Theodore J. Redding		

PURPOSE and OBJECTIVE(S):

The purpose of this calculation is to estimate the annual air emissions of tritium that resulted from the disposal of water pumped from the sump and collected as condensate from air conditioning in the basement of Building A-1, North Las Vegas Facility (NLVF). Water from both locations was combined in a tank truck and was disposed of through either evaporation at the NLVF, or transported to the Nevada Test Site and placed in the Area 23 Sewage Lagoons. Almost all water came from the basement sump and about 59% was evaporated on the north side of Building A-1 during the warm months with most of the remaining 40% transported to the NTS during cooler periods when the evaporation technique was not effective (see email message from Jose Gonzales copied below). About 1% of the water pumped from the well was in the Tanker truck at years end. To estimate the tritium in air emissions from the Area 23 Sewage Lagoons or from the evaporators on the north side of Building A-1, the average concentration of tritium in water samples collected from the Building A-1 Tanker Truck (see Table 1 below) during 2009 was multiplied times the respective total volumes of water disposed by these two methods. This information will be included in the 2009 calendar year report concerning NTS compliance with the National Emission Standards for Hazardous Air Pollutants.

DISPOSED WATER VOLUMES:

According to the attached email, a total of 263,677 gallons was disposed from the Bldg A-1 during CY 2009. About 154,138 gallons (583,412 L) were evaporated on-site and about 106,414 gallons (402,777 L) were transported to the NTS for disposal.

TRITIUM CONCENTRATION IN WATER SAMPLES:

Table 1 lists the tritium concentration in water samples collected from source water. The average tritium concentration of 903 pCi/L was applied to all water disposed (released to air though evaporation). Tritium concentrations in sump well water through time are displayed in Figure 1.

Table 1. Tritium concentrations in water samples taken from Building A-1 Tanker Truck

SAMPLING LOCATION	SAMPLE ID	COLLECT DATE	RESULT (pCi/L)	2 SIGMA (pCi/L)	MDC (pCi/L)
A-1 TANKER TRUCK	EM00013903	6-Apr-09	1110	289	337
A-1 TANKER TRUCK	EM00014339	8-Sep-09	696	171	237
2009 Average=			903		

TRITIUM EMISSIONS FROM BUILDING A-1 WATER EVAPORATED AT NLVF:

$$903\text{pCi/L} \times 583,412 \text{ L} \times 1\text{mCi}/1\text{E}09 \text{ pCi} = 0.53 \text{ mCi}$$

TRITIUM EMISSIONS FROM BUILDING A-1 WATER TRANSPORTED TO AREA 5 SEWAGE LAGOON

$$903 \text{ pCi/L} \times 402,777 \text{ L} \times 1\text{mCi}/1\text{E}09 \text{ pCi} = 0.36 \text{ mCi}$$

EMAIL DATED 1/20/2010 FROM JOSE L. GONZALES TO RONALD WARREN :

From: Gonzales, Jose L
Sent: Wednesday, January 20, 2010 8:03 AM
To: Warren, Ronald
Cc: Drellack, Sigmund; Mercadante, Jennifer
Subject: CY 09 Bldg. A-1 Source Well Data

2009

A-01 Source Well and Evap Coolers

Month	Pump Readings	Water pumped	Evap Readings	Water Evaped	Date Wtr sent to nts	Gallons sent
Jan	717699 699501	18198	503118 503118	0	7,14,21 28	15550
Feb	741515 717699	23816	503118 503118	0	4,11,18, 25	16305
March	753770 735537	18233	503119 503119	0	4,11,18, 25	17068
April	776832 753770	23062	513926 503119	10807	1,8,15	12371
May	798664 776832	21832	535817 513926	21891		0
June	823840 798664	25176	561354 535817	25537	6/18/2009	3000
July	848133 822440	25693	587911 561354	26557		0
August	877163 848133	29030	616502 587911	28591		0
September	898514 877163	21351	640283 616502	23781		0
October	917800 898514	19286	657257 640283	16974	21,28	7178
November	937257 917800	19457	65725 65725	0	4,10,18 25	16639
December	955800 937257	18543	65725 65725	0	9,16,22 29	18303
Year 09 totals		263677		154138		106414
Gallons in Tanker		3125				

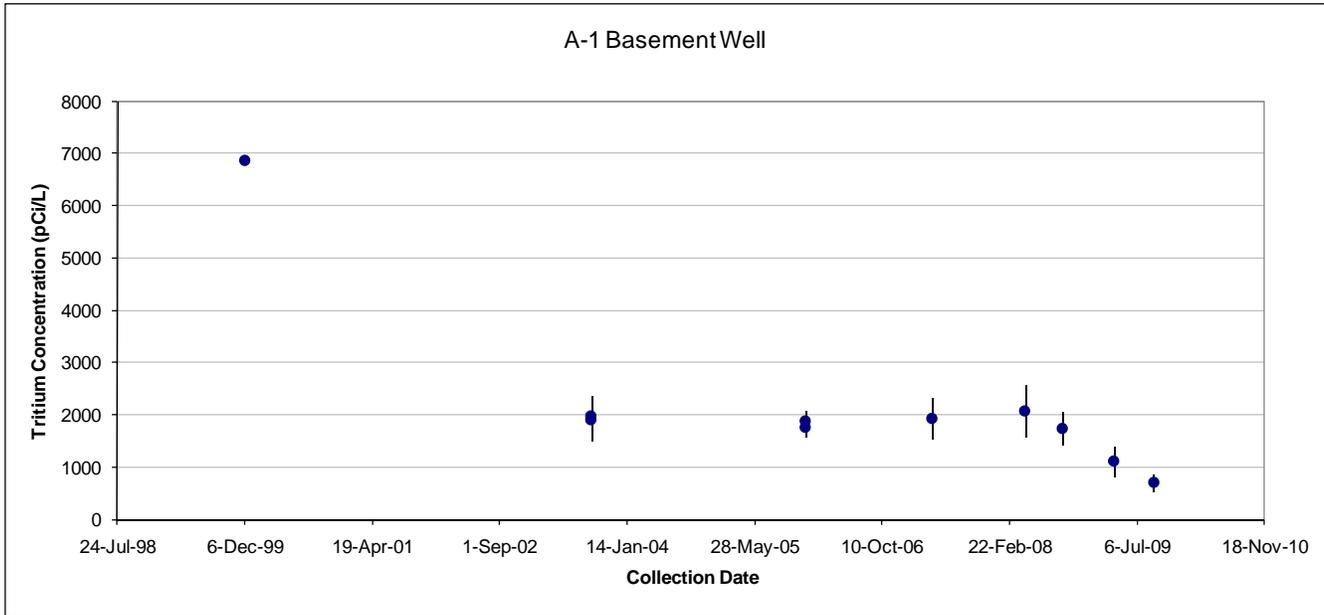


Figure 1. Concentrations of tritium in Building A-1 basement source well water through time. Error-bars represent only counting uncertainty (± 2 standard deviations). The sample specific minimum detectable concentrations for samples 2007 – 2009 was about 360 pCi/L.